

CLAIMS

1. Method of arc welding elements (16, 16a, b, c, d, e), in particular metal studs, to coated parts (18), in particular metal sheets, in which an element (16, 16a, b, c, d, e), in a first step, is moved relative to the part (18) to break up the coating (68) of the part (18) at least partially to produce an electrical contact between part (18) and element (16, 16a, b, c, d, e), the part (18) and the element (16, 16a, b, c, d, e) to be welded to each other in a subsequent step, characterized in that the element (16, 16a, b, c, d, e) is set in oscillating motion about its lengthwise axis (24) in order at least partially to break up the coating (68) of the part (18).

2. Method according to claim 1, characterized in that the element (16, 16a, b, c, d, e), during the first step, is moved to and fro relative to the part (18), oscillating in axial direction.

3. Method according to claim 1 or 2, characterized in that the part (18) is freed from remnants of the coating (68) by means of excess pressure or negative pressure.

4. Method according to any of the preceding claims, characterized in that use is made of an element comprising a flange neighborhood (17, 17a, b, c, d, e) on the part side.

5. Method according to any of the preceding claims, characterized in that the coating is scored by means of elevations (57, 57a, b, c, d, e) projecting from the flange neighborhood (17, 17a, b, c, d, e).

6. Method according to claim 4 or 5, characterized in that an element is used having a flange neighborhood (17, 17a) comprising a projection (56, 56a) of annular configuration.

7. Method according to any of the preceding claims, characterized in that after the first step, a second step is performed, in which the part (18) is cleaned by means of an electric arc (62).

8. Method according to claim 7, characterized in that the arc (62) is deflected during the cleaning step by a magnetic field (60).

9. Method according to claim 8, characterized in that the magnetic field (60) is so oriented that the arc (62) during the cleaning step revolves in a closed path about the lengthwise axis (25) of the part (16, 16a, b, c, d, e).

10. Method according to claim 7, 8 or 9, characterized in that the second step is followed by a third step in which the voltage between part (18) and element (16, 16a, b, c, d, e) is reversed and the element (16, 16a, b, c, d, e) is welded to the part (18).

11. Device for arc welding of elements (16, 16a, b, c, d, e), in particular metal studs, to parts (18), in particular metal sheets, having a welding head (12) on which a holder (14) is provided to accommodate an element (16, 16a, b, c, d, e) to be welded, having a power supply means (22) to supply electrical energy, and having means to move the holder (14) relative to the part, characterized in that the holder (14) may be driven in oscillation about its lengthwise axis (24).

12. Device according to claim 11, characterized in that the holder (14) comprises a magnetic drive (38, 40) to generate the oscillating motion about the lengthwise axis (24).

13. Device according to claim 11, characterized in that the holder (14) is coupled to a drive lever (36) having a radial segment (38) movable to and fro between two mutually opposed coils (40, 48).

14. Device according to claim 11, characterized in that the holder (14) is coupled to an eccentric drive (36a, 38a, 50, 52, 54) to generate the oscillating motion about the lengthwise axis (24).

15. Device according to claim 11, characterized in that the holder (14) is movable forward and back in axial direction relative to the part (18).

16. Device according to claim 15, characterized in that, for the drive in axial direction, a linear motor (42) is provided.

17. Device according to any of the preceding claims, characterized in that on the welding head (12), an opening (34) is provided, connectable with a source of negative pressure or a source of excess pressure.

18. Device according to any of claims 11 to 17, characterized in that, on the welding head (12), a means of generating a magnetic field is provided, preferably an electromagnet (58), to deflect an electric arc (62) set up between the part (18) and the element (16, 16a, b, c, d, e) on a closed path about the lengthwise axis (25) of the element (16, 16a, b, c, d, e).

19. Element, in particular metal studs to be arc welded to coated parts (18), in particular metal sheets, having a flange neighborhood (17, 17a) to be welded to the part (18), on which neighborhood elevations (57, 57a) are provided to score the coating (68) on the part (18), characterized in that the flange neighborhood (17, 17a, b, c, d, e) comprises a projection of annular configuration (56, 56a) on whose face the elevations (57, 57a) are configured.